

Answer the following questions:

Q(1): [a] Put (✓) for true statement or (x) for false statement

- ✓ [1] The 80386 was 16-bit microprocessor. X
- ✓ [2] The memory system is divided into TPA, XMS. X
- ✓ [3] A bus is set of common connection lines that carry the same type of information. ✓
- ✓ [4] In real mode, segments can begin at any location in the memory system X
- ✓ [5] A memory segment can touch or even overlap. ✓
- ✓ [6] MOV BL, AX X
- ✓ [7] MOV CS, BX X
- ✓ [8] PUSH AX is equivalent to PUSH EAX X
- ✓ [9] MOV ES, DS X
- ✓ [10] MOV [DI], [BX] X

مراجعة بنيل

[b] In the microprocessor 80286, explain the main data addressing modes.

80386

Q(2): [a] In a machine language instruction, what is specified by the MOD field? the R/M field? and the D and W bits.

[b] Explain the meaning of the following instructions

- ✓ 1. LODSB
- ✓ 2. LOOP AGAIN
- ✓ 3. POP DS
- ✓ 4. MOV BX, OFFSET DATS
- ✓ 5. MOVSW DX, BL
- ✓ 6. IN AX, DX
- ✓ 7. LES BX, CAT
- ✓ 8. DATA2 DW 2000H

1) X

2) X

3) ✓

4) X

5) ✓

6) X

7) X

8) X

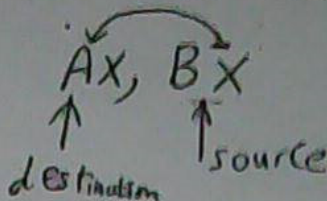
9) X

10) X

(4) Addressing modes

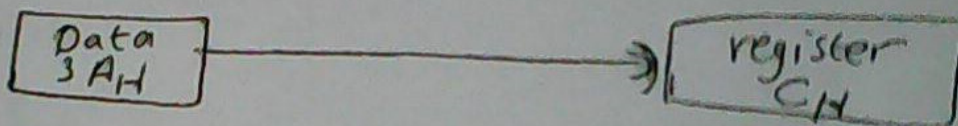
- ① register addressing transfer word or byte from source register to destination register

ex: MOV AX, BX



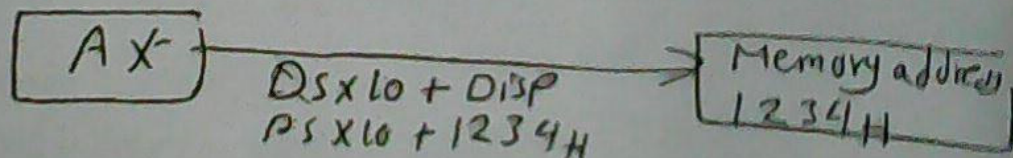
- ② immediate : transfer source - immediate byte or word of data into destination register or memory location

→ ex: MOV CH, 3AH



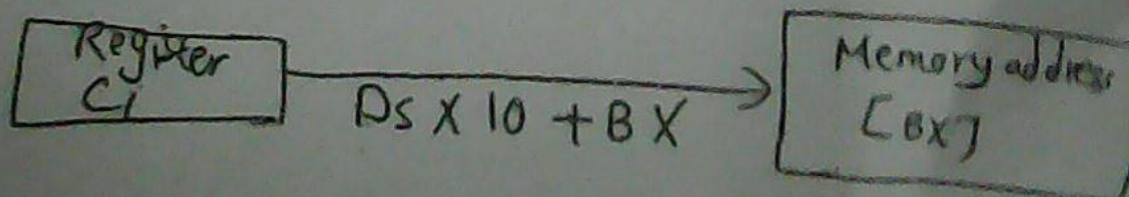
- ③ Direct move byte or word between a memory location and a register

ex: MOV [1234H], AX



- ④ Register indirect : move byte or word between a register and a memory location addressed by an index base register

ex: MOV [BX], CL



9) D (Direction)

$D=1$ data flow to Register REG field R/M field

$D=0$ data flow to R/M field from AL field

W (word or doubleword)

$W=0$ data is byte

$W=1$ data is word or doubleword according to type of instruction (16 or 32 bit)

6)

① LODSB

$AL = DS:[SI]$

it will Load a byte of data stored at the data segment offset address indexed by SI register into AL

② Loop Again

- The instruction decrement the content of CX and if $CX \neq 0$, it jump to the address indicated by label again

3. POP DS

- It will remove data ^{16bit (Word)} from the top of stack, and place it into register (DS)
- after it, SP is incremented by 2

4. MOV BX, offset DATs

- it will place the offset address DATs ~~into~~ of Memory Location DATs into register BX

5. MOVSBX DX, BL

MOVSBX (Move and sign extend)

- The content of register BL is copied into DX, and sign-bit ^{of BL} is copied to Most significant bits of DX

6. IN AX, DX

- it will allow data transfer from port indicated by variable ^{port} address Indicated by DX into register AX

7. LES BX, CAT

- It will place the offset address of Memory Location CAT into register BX

⑧

DATA DW 2000H

-it means that, it define a variable DATA:
as a word variable and place content
(16 bit)
2000H into Memory Location DATA